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Under the project "spreading water for storage underground" Dean C. Muckel reports that a plot at Azusa, Calif., was operated continuously during the month, but that cold weather resulted in very little root action of the vegetative cover and low percolation rates prevailed. The exposed soil became frozen and about one-fourth of the water surface was covered with ice. The canyon plots near Azusa were not put in operation as the groundwater level was still rising due to spreading on adjacent lands. It was intended to delay the starting of these plots until the watertable movement had ceased, thereby making it easier to follow the effect of spreading operations upon the water table. At Cold Water Canyon water was spread during most of the month. High rates of percolation were obtained, especially on a newly developed area of the gravel cone. On Cucamonga Creek two galvanized iron Parshall flumes are being installed in a large spreading ditch for the purpose of measuring the loss in flow between two stations. As the ditch is expected to carry more water than will pass through the flumes in times of heavy run-off, it is necessary to construct low concrete walls across the ditch in order to divert small flows and permit large flows to pass over without damage. The larger flows will be measured in the 15-foot Parshall flumes installed in 1934.

Snow cover measurements were made on many courses of the Columbia and Missouri River basins and the Pacific Slope basin on or about January 30, and reports prepared and distributed. Owing to the intense cold in many localities during January, the snow storms were relatively heavy in low altitudes and light at higher elevations. In some instances temperature conditions were reversed later and much of the precipitation deficiency in high altitudes was made up.

R. L. Parshall prepared a summary relative to the Colorado-Big Thompson transmountain diversion project, including the agricultural features. He also consulted with representatives of the University of Denver on studies of annual losses in crop values throughout the project area because of the shortage of water for the period 1925-1935, which studies by the University, indicate a loss of more than \$4,000,000 on this account.

Leslie Bowen presented a discussion on "Water Requirements of Some Crops under Irrigation," before an agricultural conference held at Denver, sponsored by the Great Western Sugar Company, attended by field men, superintendents, managers, etc., of the Company, from the various territories in which it operates. At this meeting R.L. Parshall discussed the relation of irrigation water to sugar beet yields in northern Colorado, and referred also to the economic value of the Colorado-Big Thompson project.

Karl Harris reports that the last picking of Pima cotton on plots near Phoenix, Ariz., was made January 12. Soil moisture determinations while the plants are young in Pima cotton fields indicate that water is withdrawn from the

soil at a uniform rate, from the water-holding capacity down to the wilting point. Meanwhile the plant is increasing in size and the temperature is rising, both of which conditions make for an increased rate of withdrawal of moisture from the soil. It appears, therefore, that the increased difficulty that plants have in withdrawing moisture from the soil as the percentage of moisture decreases is offset by the increased size of plants. It is apparent that for the best results Pima cotton should get as much growth as possible before the middle of August and that irrigating the cotton early makes for a more rapid growth.

Preparation of the report on the Rio Grande study for the National Resources Committee was continued by Messrs. Blaney, Ewing, and Rohwer in the Berkeley office. D.W. Bloodgood prepared a description of Irrigation in the Mesilla Valley, New Mexico, for inclusion in the report, and A.A. Young contributed a discussion of use of water by natural vegetation. The latter included a resume of previous investigations of use of water by natural growth and comparison with those undertaken during the summer of 1935, both in the San Luis Valley, Colorado, and the Middle Rio Grande Valley near Albuquerque, New Mexico.

At the request of the Resettlement Administration, Lewis A. Jones made an inspection of the Scuppernon Farms Project located near Phelps Lake, Washington County, N.C., and reviewed the proposed plan of drainage for the project.

F.E. Staebner visited Erie, Pa., where, in company with Professor Erp of Ohio State University, he investigated a proposed project to irrigate some 575 acres of land in alfalfa owned by one of the large dairy farmers in that region. As a result of the inspection detailed plans for irrigating about 60 acres have been developed and it is expected that the installation will be made during the coming spring.

Enrollee and Bureau personnel from the C.C.C. Central District have assisted in a wide variety of work in the flooded areas, providing labor for strengthening levees, sand bagging breaks and sand boils, loading supplies and equipment, transporting people and supplies, constructing rafts, operating boats, assisting in survey crews, guarding property, patrolling levees, and as cooks, guides and messengers. Prior to assumption of control by the Army and Red Cross, effective organization and direction of evacuation and removal of marooned victims, was carried on under the direction of Bureau personnel, both in the southeastern Missouri area and the Kentucky-Evansville area. Through February 15, a total of 12,210 enrollee man-days, 917 man-days technical service personnel and 1416 truck-days have been expended on this work.

Accomplishments on regular projects during the month were as follows: Excavation and embankment - 447,339 cubic yards, using 9,894 man-days; clearing - 6,130,023 square yards, using 48,255 man-days; 10,169 feet of tile reconditioning, using 2,845 man-days; and 14,016 man-days on structural and other work including 7,600 on flood emergency. Cooperation furnished during the month by the applicants amounted to \$42,200.

A recent report prepared in the District Office indicates a total of 155,557 pounds of various makes and kinds of dynamite used in the work program of the Central District to date. Of this total, 43,968 pounds was furnished by the Bureau and the remaining 111,589 pounds by the applicants. A total of 41,419 electric blasting caps have been used, 11,778 furnished by the Bureau and the remaining 29,641 by the applicants.

In January, E.M. Mervine was on the program of the convention of the Great Western Sugar Company Agricultural Department employees. This group came from four States and represents approximately one-third of the sugar production area of continental United States.

S.W. McBirney attended the meeting of the Pacific Coast Section of the A.S.A.E. in Berkeley on February 5. In addition to the program, chiefly on land utilization, which has been published, the annual business meeting was held, officers were elected and plans were discussed for the annual A.S.A.E. meeting in California in 1938.

The preliminary drawings of the wheel test unit have been completed by E.D. Gordon, and the plans have been submitted to the committee of the Society of Automotive Engineers for criticism prior to their final completion. The test wheel, by means of dual gearing, will be over-driven in different ratios to obtain different percentages of slip. The drawbar pull developed by wheel, weight translocation and side thrust will be measured by hydraulic recorders.

A series of tests is under way at the Farm Tillage Machinery Laboratory by I.F. Reed to determine the effects of size of plow bottom upon draft per unit width. These tests are being carried on in three soil types and at speeds varying from 1 to $7\frac{1}{2}$ miles per hour. The draft of the bottom, colter and frame will be determined separately, then assembled to get the plow draft.

The first writing of a manuscript on the performance characteristics of 5- and 6-foot combines, by W.M. Hurst and W.R. Humphries, has been completed. Results of field studies conducted in 1935 and 1936, showing losses of small grain and soybeans incident to the use of these machines, are included. The manuscript is being prepared for publication as a Department Circular.

During the week of February 15, W.M. Hurst made a trip to Orange, Culpepper, and Richmond, Va., to inspect several grain and fungicide feeders which were constructed at these locations. This machine, designed by Bureau engineers, automatically applies specific amounts of dust fungicides to seed grain for controlling smut and other diseases. Several of these machines have been built by commercial seedsmen and others and have been found very satisfactory.

G.A. Cumings recently visited several southeastern experiment stations and attended the meeting of the Association of Southern Agricultural Workers in Nashville, Tenn., February 3 and 4, in connection with fertilizer machinery research and developments. Many farmers in the Southeast have become interested in improved methods of applying fertilizers for various crops, particularly cotton and tobacco. The principal demand is for improved machines of the one-mule or walking type and for procedures that might be followed with existing machines. To meet this demand several manufacturers have recently developed walking type fertilizer distributors and combination planters and distributors with which the fertilizer can be placed to the side of the row as now recommended. The lack of information on the adaptability and performance of this new equipment makes it difficult for local authorities to definitely advise the farmers. Mr. Cumings also conferred with John W. Randolph at Auburn, Ala. regarding fertilizer application in relation to tillage practices.

James E. Miller spent several days during the first half of February at Charleston, S.C., for the purpose of inspecting the U.S. Regional Vegetable Breeding Laboratory now nearing completion near that city. The plans for this job were prepared in the Bureau last spring for the Bureau of Plant Industry.

On a recent field trip J.R. Dodge visited the University of Wisconsin to consult with Max J. LaRock of the Bureau and Professors Jones and Witzel of the Agricultural Engineering Department, and Miss May Cowles of the Home Economics Department regarding the cooperative farmhouse research project. Later he spent about two weeks at Iowa State College working with Prof. J.B. Davidson of the Iowa Agricultural Engineering Department on the design of a low cost farmhouse. He spent a day at Lafayette, Ind., visiting the low-cost houses of the Purdue Housing Foundation.

In the Farmers' Week program at the University of Wisconsin, Max J. LaRock exhibited a number of the Bureau's water color drawings of farm buildings, and demonstrated the use of his thermocouple equipment for reading temperatures in cooperating farmhouses. He gave a talk on "Can the Farm Home be Remodeled?"

A.D. Edgar returned from Aroostook County, Maine, where he inspected potato houses that had been used in previous experimental work. Temperature and air velocity readings were obtained in connection with the experimental insulation panels which were installed in one of the houses last year. The winter in Presque Isle has been unusually warm. Temperatures during December and January averaged 10° above normal. A few cold days, however, enabled Mr. Edgar to obtain satisfactory readings on the insulation samples. He reports much more difficulty than usual this year in the storage of potatoes, due to late blight before the potatoes were harvested and bad weather conditions at time of harvesting. Conditions in the houses where he has carried on experimental work are well above average. Owing to difficulties in storage and the high prices, it is expected that many farmers will improve their storages during the coming year.

A paper on the Georgia farmhouse research project was presented by J.W. Simons at the meeting of the Southern Section of A.S.A.E.

On January 18 A.H. Senner gave a talk on The Proper Installation of the Domestic Oil Burner before the Baltimore Society of Air Conditioning, and on January 20 he presented a paper on bottled gas at the convention of the National Bottled Gas Association.

Publications issued: None.